Operating Instructions

Miniature Circuit-Breaker

> 8562/5

STAHL

1 Contents

2 General Information

2.1 Manufacturer

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2.2 Operating Instructions Information

ID-No.: 149909 / 8562604300
Publication Code: 2014-06-04·BA00·III·en·07
Subject to alterations.

2.3 Symbols

Warning!
This symbol indicates advice which, if ignored, puts your health or the ability of the device or components to function at risk.

Note
This symbol indicates important additional informations, tips and recommendations.

3 Safety Instructions

The most important safety instructions are summarized in this section. They supplement the corresponding regulations which the staff responsible must study.

When working in areas, subject to explosion hazards, the safety of personnel and plant depends on complying with all relevant safety regulations. Assembly and maintenance staff working on installations therefore have a particular responsibility. They require precise knowledge of the applicable standards and regulations.

⚠ As a user, please observe:
- national and local safety and accident prevention regulations,
- national and local assembly and installation regulations (e.g. IEC/EN 60079-14),
- generally recognised technical regulations,
- safety instructions and information in these operating instructions,
- characteristic values and rated operating conditions on the rating and data plates,
- instruction plates on the unit,
- that any damage can invalidate the Ex-protection.

Use the miniatur circuit-breakers **in accordance with their designated use** and for their intended purpose only (see “Function of Miniature Circuit-Breaker Type 8562/5“ on page 3). Incorrect or impermissible use or non-compliance with these instructions invalidates our warranty provision. No modifications or alterations to the devices impairing their explosion protection are permitted. The miniatur circuit-breakers must only be fitted and operated if they are undamaged, dry and clean.

4 Conformity with standards and regulations

See certificates and EC Declaration of Conformity: www.stahl-ex.com

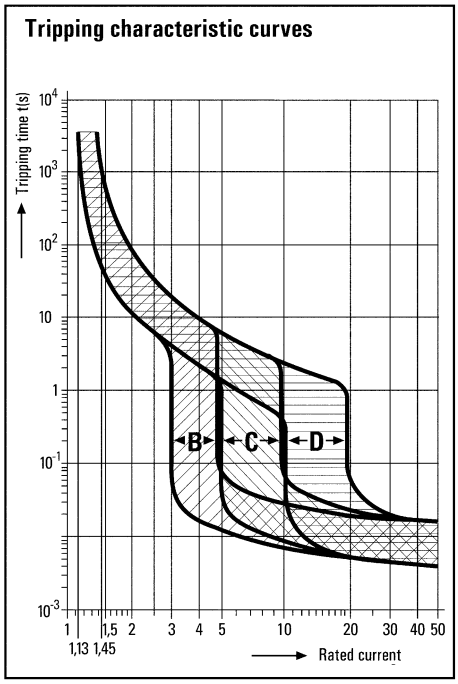
5 Function of Miniature Circuit-Breaker Type 8562/5

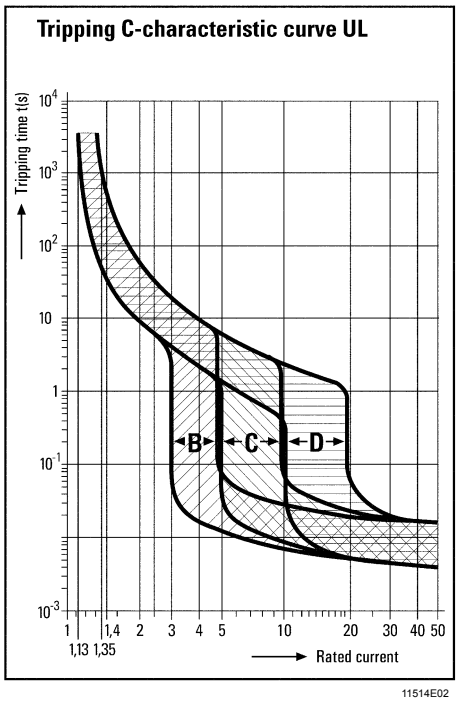
The Series 8562 Miniature Circuit-Breaker protects cables against overload and short-circuit in hazardous areas. It is designed for fitting into an enclosure with type of protection increased safety „e“.

6 Technical Data

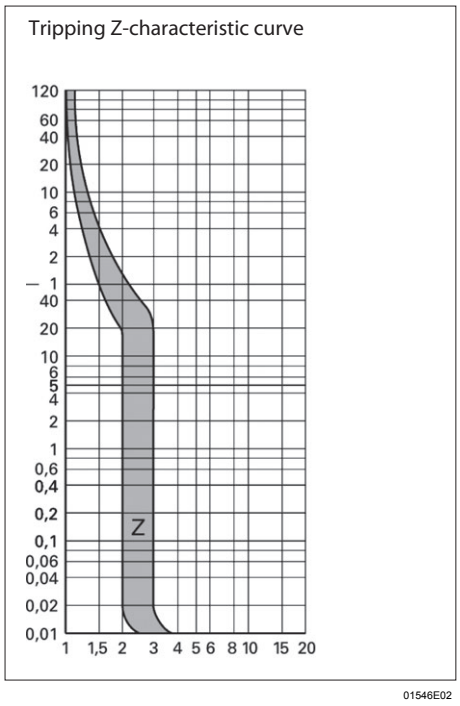
Version	**AC MCBs**		**AC / DC MCBs**	
Explosion protection				
Gas explosion protection				
ATEX	Ⓔx II 2 G Ex d e IIC Gb Ⓔx I M 2 Ex d e I Mb		Ⓔx II 2 G Ex d e IIC Gb Ⓔx I M 2 Ex d e I Mb	
IECEx	Ex d e IIC Ex d e I		Ex d e IIC Ex d e I	
Certificates				
ATEX	PTB 02 ATEX 1049 U		PTB 02 ATEX 1049 U	
IECEx	IECEx PTB 06.0062U		IECEx PTB 06.0062U	
Rated operational current	Tripping characteristic B	6 ... 40 A	Tripping characteristic B	6 ... 40 A
	Tripping characteristic C/D/Z	0.5 ... 40 A	Tripping characteristic C/D	0,5 ... 40 A
No. of poles	1 pole, 1 pole + N, 2 pole, 3 pole, 3 pole + N, 4 pole		1 pole, 2 pole	
Rated frequency	50 / 60 Hz		50 / 60 Hz DC	
Rated insulation voltage	500 V		500 V	
Rated operational voltage	**Standard version**		**Standard version**	
	AC	DC	AC	DC
	1 pole 230 V	48 V	1 pole 230 V	220 V
	1 pole + N 230 V	- -	1 pole + N - -	- -
	2 pole 230 / 400 V	110 V [1]	2 pole 230 / 400 V	220 V 440 V [1]
	3 pole 230 / 400 V	- -	[1] 2 poles in series	
	3 pole + N 230 / 400 V	- -		
	4 pole 230 / 400 V	- -		
	[1] 2 poles in series			
	UL-Version			
	1 pole 277 V [2]	60 V [2]		
	1 pole 230 V [3]	60 V [3]		
	2 pole 277 / 480 V [2]	125 V [2]		
	2 pole 230 / 400 V [3]	125 V [3]		
	3 pole 277 / 480 V [2]	125 V [2]		
	3 pole 230 / 400 V [3]	125 V [3]		
	[1] acc. to UL 1077 [2] acc. to EN 60898			
Minimal Voltage U_{bmin}	12 V AC / DC		12 V AC / DC	
Maximal Voltage U_{bmax}	AC 250 V / 440 V		AC 250 V / 440 V	
	DC 53 V / 120 V		DC 250 V / 440 V	
Service life				
Mechanical	$2x10^4$ switching cycles		$2x10^4$ switching cycles	
Electrical	10^4 switching cycles		10^4 switching cycles	
Isolation function	yes (IEC/EN 60947-2)		yes (IEC/EN 60947-2)	
Pulse resistance	6 kV		6 kV	
Utilization category	A (IEC/EN 60947-2)		A (IEC/EN 60947-2)	

Tripping characteristic curves





Tripping characteristic curves



Selectivity class

3 (IEC/EN 60898)

Response value of short-circuit trip

The response value of the short-circuit trip is approximately 40 % higher for DC than for AC at 50 / 60 Hz

Rated switching capacities

	AC MCBs						
	Poles	Series with 6 kA			Series with 10 kA		
			Voltage (V)	Current (kA)		Voltage (V)	Current (kA)
AC to IEC/EN 60898	1 - 4	I_{cn}	230 / 240	6	I_{cn}	230 / 240	10
AC to IEC/EN 60947-2	1	I_{cu}	240	10	I_{cu}	240	15
	1+N, 2	I_{cu}	127	30	I_{cu}	127	40
			240	20		240	30
			415	10		415	15
	3, 4	I_{cu}	240	20	I_{cu}	240	30
			415	10		415	15
DC to IEC/EN 60947-2 (Time constante 15 ms)	1	I_{cu} / I_{cs}	60	20	I_{cu} / I_{cs}	60	25
	2		125	25		125	30
	AC / DC MCBs						
AC to IEC/EN 60898	1	I_{cn}	230	6			
	2	I_{cn}	230 / 400	6			
	1, 2	I_{cn}	120	10			
	2, 3	I_{cn}	240	10			
DC to IEC/EN 60898	1	I_{cu} / I_{cs}	220	6			
	2		220 / 440	6			
	1	I_{cn}	125	10			
	1, 2	I_{cn}	220	6			
	2	I_{cn}	250	10			
	2	I_{cn}	440	6			

Breaking capacity

6 kA resp. 10 kA

Version

Circuit breaker, current limiting with thermal and magnetic release

Characteristics

Characteristic to IEC/EN 60898	Z		B	C	D
Rated current range	0.5 ... 32 A		6 ... 32 A	0.5 ... 32 A	0.5 ... 32 A
Loads	> Semi-conductor devices		> Elektric heatings > Lighting > Socket outlet circuits > Control circuits e.t.c.	> Operating equipment > Light fitting groups > Motors > Transformers e.t.c.	> Operating equipment > Motors with heavy starting characteristic e.t.c.
Normal temperature	20 °C	30 °C	30 °C	30 °C	30 °C
Thermal overload trip	1.05 ... 1.2 I_n	1.13 ... 1.45 I_n	1.13 ... 1.45 I_n	1.13 ... 1,45 I_n	1.13 ... 1.45 I_n
Thermal overload trip 135% UL	--	--	--	1.13 ... 1.35 I_n	--
Magnetic trip	2 ... 3 I_n		3 ... 5 I_n	5... 10 I_n	10 ... 20 I_n

Back-up protection

Fuses must be fitted upstream to protect miniature circuit-breakers against high short-circuit currents in high power networks. These protect the miniature circuit-breakers against short-circuit currents of up to 50 kA. If a short-circuit occurs, both protective devices cut out simultaneously, so that the miniature circuit-breaker is not destroyed and remains fully functional.

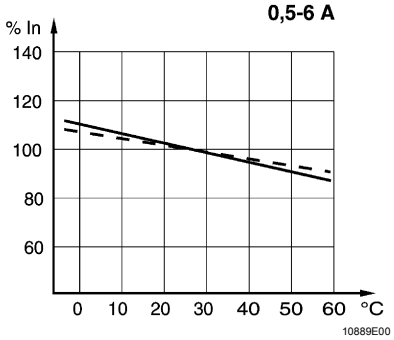
Following MCBs				
Type	MCB tripping characteristic	C, D	B, Z	B, C, D, Z
	Rated operational current I_{th} (A)	Preceding fuse type gG		
		Minimal rated operational current (A)		Maximal rated operational current (A)
8562/5	1	4	- -	- -
	2	8		63
	3	10		
	6	20	10	80
	10	25	16	
	16	40	20	
	20	50	32	100
	25	63	40	
	32	80	50	
	40	100	50	125

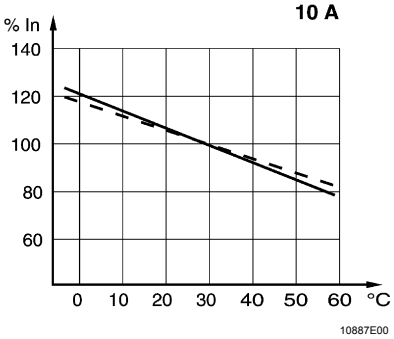
Ambient temperature

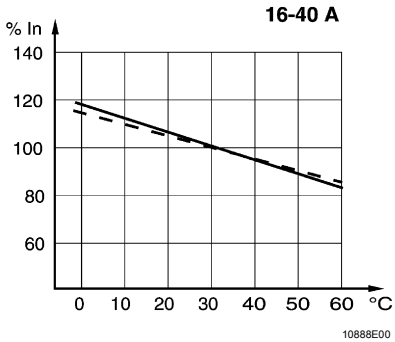
- 20 ... + 60 °C In case of different temperature range please consider correction factor!

Correction factors

Correction factors for ambient temperatures other than 30 °C







Degree of protection

Degree of protection acc. to IEC/EN 60529
Connecting terminals IP20

Material

Enclosure: Epoxy resin

Weight

Type 8562/51	520 g
Type 8562/52	1040 g
Type 8562/53	1400 g
Type 8562/54	2050 g

Auxiliary contact

Version: see circuit diagrams

Fault signal switch: This switch indicates independent switching of the protective device on overload or short-circuit.

Auxiliary switch: The switch indicates the status of the protective device (ON/OFF), whether it is switched manually or automatically.

Rated operating current [A]	AC-14	230 V AC	5 A
	DC-12	60 V DC	1 A
	DC-12	48 V DC	2 A
	DC-12	24 V DC	4 A
Min. switching voltage	AC	24 V	
	DC	24 V	
Min. switching current	AC	10 mA	
	DC	200 mA	
Rated short-circuit limit current: back-up protection via fusible link 6 A gG		1 kA	

Auxiliary contact

Remote trip

This opens the connected protective device when triggered.

Rated operational voltage	AC	110 / 415 V
	DC	110 / 125 V
	AC	24 / 60 V
	DC	24 / 48 V
Tripping time	< 10 ms	

Undervoltage trip

The undervoltage trip triggers the circuit breaker if the voltage drops below 50% of the rated operational voltage (0.5 x Ue).

Rated operational voltage	AC	240 V
	AC/DC	12 V
	AC/DC	24 V
	AC/DC	48 V
Tripping time	< 150 ms	

☞ Please contact the manufacturer if operating conditions are non-standard.
Further technical data is given in the STAHL catalogue or is available upon request.

☞ The temperature class depends upon where the protective enclosure is installed.

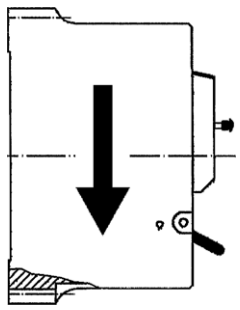
☞ Change the Miniature Circuit-Breaker at the end of its service-life to guarantee ongoing protection!

☞ Upstream fuse/downstream Miniatur Circuit-Breaker for back-up protection
$I_{cc\ max}$: 100 kA (80 kA, 400 V with fuse)

7 Arrangement and Assembly

⚠ These circuit-breakers are explosion-protected devices to IEC/EN 60079-0. They must be fitted into an enclosure with type of protection increased safety “e“, e.g. enclosure Type 8146/5 from R. STAHL Schaltgeräte GmbH.

7.1 Mounting Orientation



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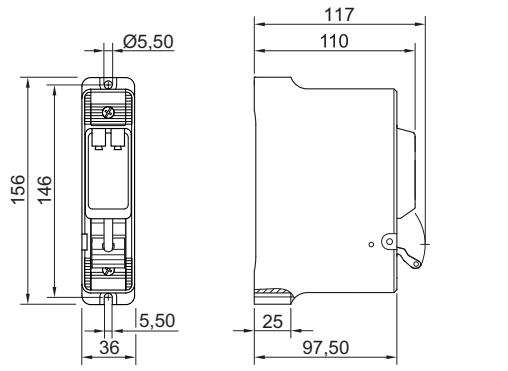
Vertical,
Handle at the bottom

7.2 Dimensional Drawings

Dimensional Drawings (All Dimensions in mm) - Subject to Alterations



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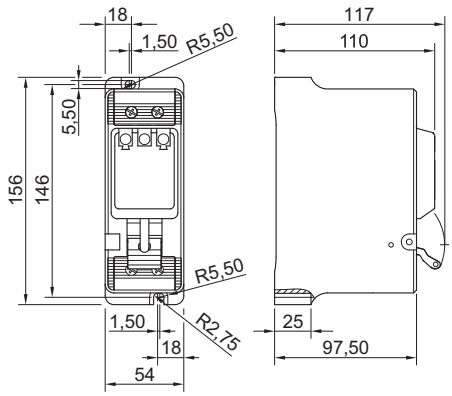
MCB 8562/51-...



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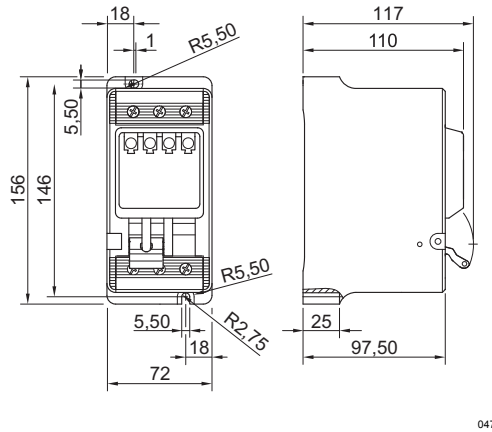
MCB 8562/52-...



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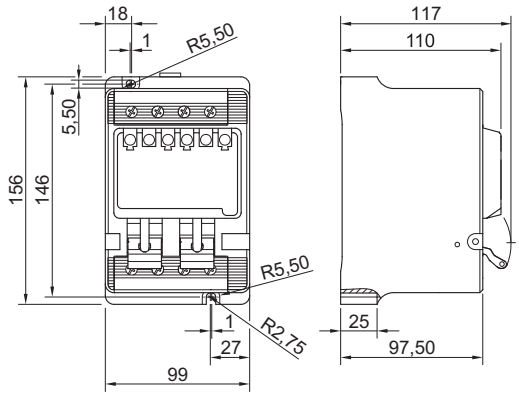
MCB 8562/53-...



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MCB 8562/54-...

8 Installation

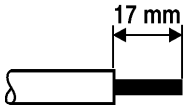
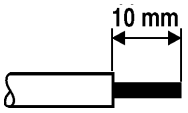
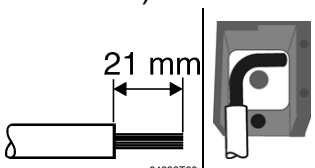
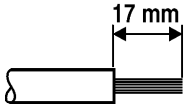
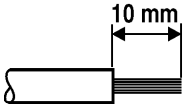
8.1 Mains Connection

⚠ Connect the cables with particular care.
Choose suitable cables and route them accordingly to ensure that the maximum permissible conductor temperatures are not exceeded.
To ensure that creepage distances are maintained remove precisely 10, 17 or 21 mm of insulation (see chapter “Rated connection cross-section“).
The conductor must not be damaged (scored) when stripping the insulation!
Only heat-resistant cables must be used, if connected directly.

8.2 Rated connection cross-section

Solid, stranded or finely stranded copper wires can be used. 1 or 2 wires of the same cross-section can be fitted under one terminal. Both wires must be made of the same material. No preparation is necessary prior to connecting the wires.

☞ When terminal sleeves are fitted, they must be applied with a suitable tool.

Conductor	Main contact terminals	Auxiliary contact terminals
single-wire	2 x 1.5 ... 10 mm²* 2 x AWG 16 to 8 	2 x 0.75 ... 2.5 mm² 2 x AWG 18 to 13 
	1 x 10 mm² (bend the end of the conductor) 	
stranded or flexible-stranded	2 x 1.5 ... 6 mm² 2 x AWG 16 to 10 	2 x 0.75 ... 1.5 mm² 2 x AWG 18 to 16 
Permissible tightening torques for the options mentioned*	3.0 Nm	1.0 ... 1.2 Nm 9 ... 11 lb.in
*Permissible tightening torques for 10 mm² single-wire cable	3.0 Nm	

Notice: Auxiliary contacts can be led out through the main contact terminals.

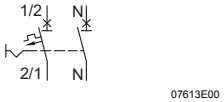
- observe the cross-sections
- note the terminal marking

Note
As part of the installation procedure, the tight fit of the clamping connection must be checked according to IEC/EN 60079-14, -17.
If necessary, the clamping connections must be retightened to the relevant torques.

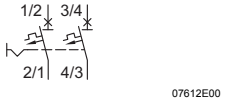
8.3 Connection diagrams

Schematic

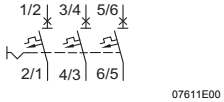
1 pole



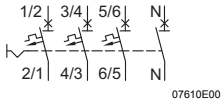
1 pole + N



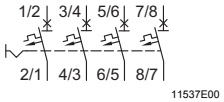
2 pole



3 pole

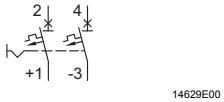


3 pole + N



4 pole

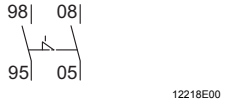
Universal current +/-, 1 pole



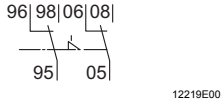
Universal current +/-, 2 pole

Auxiliary contact 1 CO

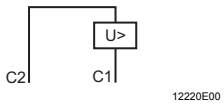
Fault indication contact 1 CO



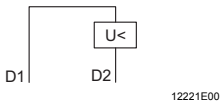
Auxiliary contact 1 NO
Fault indication contact 1 NO



Auxiliary contact 1 CO
Fault indication contact 1 CO



Remote trip



Undervoltage trip

Connect the device according to the rating plate. It has to be taken care that the neutral conductor is connected correctly.

9 Commissioning

Before commissioning, ensure that:

- the device has been installed in accordance with the standards,
- the connections have been correctly made,
- the device is not damaged,
- all screws and nuts are fully tightened.

10 Servicing

10.1 Maintenance

⚠ Maintenance and repair work on the devicess may only be carried out by appropriately authorized and trained personnel.
Before any work commences, the devices must be disconnected from the supply.

☞ Observe the relevant national regulations in the country of use!

The following items must be checked as part of the maintenance schedule:

- Check that no cable connections are loose.
- Check the plastic enclosure for cracks or other visible signs of damage.
- Check that the permitted temperatures, in accordance with IEC/EN 60079-0, are adhered to.
- Check the reset function of the switch lever.
- Check that the device functions correctly.

Maintenance Intervals

Check explosion-protected components regularly to ensure that its fitting, installation and operation are in accordance with the regulations.

Refer to the corresponding national regulations (e.g. IEC/EN 60079-14) for the type and scope of tests. The maintenance intervals must be chosen, such that the occurrence of deficiences, anticipated in the system, can be avoided.

Note the following when establishing the intervals between checks:

- the operating conditions (degree of utilization of the Miniatur Circuit-Breaker, maloperation)
- manufacturers' instructions in technical documentation (mechanical and electrical service life)
- major changes in the whole system (e.g. changes of zone allocation)

Remedial Action

⚠ Any defects, which affect the explosion protection, must be remedied immediately:

- Take the device out of operation! (Disconnect it from the supply!)
- Replace with new device!

11 Transport and Storage

Transport and Storage are only permitted in the original packing.

12 Disposal

⚠ Observe the national standards for refuse disposal.

13 EC Declaration of Conformity

Konformitätserklärung
Declaration of Conformity
Déclaration de Conformité

R. STAHL Schaltgeräte GmbH • Am Bahnhof 30 • 74638 Waldenburg, Germany
erklärt in alleiniger Verantwortung, *declares in its sole responsibility, déclare sous sa seule responsabilité,*

dass das Produkt: *that the product:* *que le produit:*	**Schutzschalter** *Circuit breaker* *Disjoncteur*
Typ(en), *type(s), type(s):*	**8562/5.-....-...**

mit den Anforderungen der folgenden Richtlinien und Normen übereinstimmt.
is in conformity with the requirements of the following directives and standards.
est conforme aux exigences des directives et des normes suivantes.

Richtlinie(n) *Directive(s)* *Directive(s)*	Norm(en) *Standard(s)* *Norme(s)*
94/9/EG: ATEX-Richtlinie *94/9/EC: ATEX Directive* *94/9/CE: Directive ATEX*	EN 60079-0:2009 EN 60079-1:2007 EN 60079-7:2007
Kennzeichnung, *marking, marquage:*	Ⓔx **II 2 G Ex d e IIC Gb** **I M2 Ex d e I Mb** **0158**
EG-Baumusterprüfbescheinigung: *EC Type Examination Certificate:* *Attestation d'examen CE de type:*	**PTB 02 ATEX 1049 U** (Physikalisch-Technische Bundesanstalt, Bundesallee 100, 38116 Braunschweig, Germany)
Produktnormen nach Niederspannungsrichtlinie: *Product standards according to Low Voltage Directive:* *Normes des produit pour la Directive Basse Tension:*	EN 60947-1:2007 + A1:2011 EN 60947-2:2006 + A1:2009 EN 61008-1:2004 + A11:2007 + A12:2009 EN 61009-1:2004 + Cor.:2006 + A11:2008 ... A13:2009
2004/108/EG: EMV-Richtlinie *2004/108/EC: EMC Directive* *2004/108/CE: Directive CEM*	Nicht zutreffend nach Artikel 1, Absatz 3. *Not applicable according to article 1, paragraph 3.* *Non applicable selon l'article 1, paragraphe 3.*

Spezifische Merkmale und Bedingungen für den Einbau siehe Betriebsanleitung.
Specific characteristics and how to incorporate see operating instructions.
Caractéristiques et conditions spécifiques pour l'installation voir le mode d'emploi.

Waldenburg, 2012-05-31

Ort und Datum
Place and date
Lieu et date

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F-4174-601 01/2011 STMZ

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